

Assessing the Effectiveness of Riparian Buffers for Maintaining Microclimate for Amphibians

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Because of their limited mobility and apparent narrow tolerance for microhabitat conditions, there is concern that amphibians may be negatively impacted by harvest activities in managed forests. Here we summarize preliminary results from investigations of microhabitat conditions in managed forests and relate them to patterns of amphibian occurrence. We measured fine-scale patterns in microhabitat (soil moisture, soil temperature, relative humidity, ambient temperature and vegetation) along transects running perpendicular from the stream edge and extending 60 m into the adjacent upland. We contrasted patterns of microhabitat found in mature (55-65 year old) and recently harvested stands with continuous and discontinuous riparian management zones. Generally, soil temperature was more variable and slightly warmer with increasing distance from streams. Soil moisture was highly variable and showed no consistent trend in relation to distance from streams. Soil moisture was higher in clearcuts than in forested areas. Surprisingly, the range of microhabitat conditions in clearcuts did not differ greatly from those found in riparian buffers or in mature forest stands. Diel patterns of ambient temperature and relative humidity suggested that microclimatic conditions in clearcut and unharvested forests were similar except during 4-6 hours of the mid-afternoon. During July-August, we found that 90% of surface active amphibians occurred within 2m of streams suggesting that protection of near stream microhabitat should be the focus of conservation measures in managed forests. Residual vegetation and woody debris available in clearcuts after harvest appeared adequate to maintain microclimate and refugia for amphibians.

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